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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 09/836,685
Filing Date: April 17, 2001
Appellant(s): ODHNER ET AL.

MAILED

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GROUP 2800

Diane E. Burke (45,725)
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed June 20, 2006 (6/20/06) appealing from the Office action mailed August 4, 2005 (8/4/05).

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5,450,512	ASAKURA	9-1995
4,528,448	DOGGETT	7-1985
5,608,278	MEY et al.	3-1997

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1, 3, 17, and 32 are all rejected under 35 U.S.C. 103(a). These rejections are set forth in the prior Office Action dated 8/4/05, and copied *infra*.

Claims 1, 17, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Asakura (U.S. Patent No. 5450512), of record, in view of Doggett (U.S. Patent No. 4528448).

Asakura discloses a system and method for treating optical signals from a source (See for example Figures 7-8), comprising a source (inherently, a source of light is required to generate the signals having wavelengths of λ_1, λ_2, λ_3 λ_4), a rotatable diffractive optical element (See 92 in Figure 8; col. 4, line 57-col. 5, line 2), and output stations (See 98, 99 in Figure 8), wherein the source carries input optical signals (See 90 in Figure 8), each of said signals being associated with a particular wavelength; the rotatable diffractive optical element (See 92 in Figure 8; col. 4, line 57-col. 5, line 2) has a surface (i.e. a single facet) carrying a diffraction grating and positioned to intercept said input optical signals for generating output optical signals and distributing any output optical signals to any output optical station (See col. 1, line 39-54; col. 2, line 49-col. 3, line 18); and the output stations positioned to receive said output optical signals from the rotatable diffractive optical element (See 98, 99 in Figure 8). Asakura lacks the

rotatable diffractive optical element being holographic and including an array of superimposed facets, each of the facets carrying a diffraction grating(s) which are superimposed, each diffraction grating being angularly offset with respect to each other. However, Doggett teaches a conventional holographic disk used to diffract light to a particular point in space (See Abstract; Figures 1-2). In particular, Doggett teaches that the disk may be made interferometrically or holographically, and that holographic diffracting elements on the disk may include an array of superimposed facets, each of the facets carrying a diffraction grating(s) which are superimposed, each diffraction grating being angularly offset with respect to each other (See for example Figures 3A, 5-7; col. 3, line 14-col. 4, line 17). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the rotatable diffractive optical element of the system and method of Asakura further be holographic and include an array of superimposed facets, each of the facets carrying a diffraction grating(s) which are superimposed, each diffraction grating being angularly offset with respect to each other, as taught by Doggett, for the purpose of increasing the duty cycle and multiplexing and demultiplexing capability of the system, since a larger number of input signals may be input and multiplexed/demultiplexed by the diffraction gratings, while preventing degradation of the diffracted output signals.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Asakura in view of Doggett as applied to Claim 1 above, and further in view of Mey et al. (U.S. Patent No. 5608278), of record.

Asakura in view of Doggett discloses the invention as set forth above in Claim 1, except for the rotatable diffractive optical element being provided as a magnet having a rotatable holographic diffraction grating attached to the magnet and being magnetically coupled to a coil energizable for movement of the magnet and the diffraction grating. However, Mey et al. teaches a method and apparatus for moving a diffractive optical element (See Figures 1, 3, 4), comprising a magnet (See for example 72 in Figure 3) having a holographic diffraction element (See 26 in Figure 3) attached thereto, and being magnetically coupled to a coil (See col. 4, lines 7-49) energizable for movement of the magnet and diffraction grating. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate a magnetically movable diffractive optical element, as taught by Mey et al., in the system and method for treating optical signals from a source, as disclosed by Asakura in view of Doggett. One would have been motivated to do this to utilize fewer moving parts, thus decreasing system complexity and cost, as well as reduce system start-up torque, thus reducing the amount of power required to operate the system.

(10) Response to Argument

The Appellant's arguments and remarks filed 6/20/06 in response to the final rejection, dated 8/4/05, have been fully considered, however they are not found persuasive.

A) Response to arguments regarding Claims 1, 17, and 32 (See Pages 11-16 of Appellant's brief filed 6/20/06)

It is the Appellant's belief that the combined teachings of Asakura and Doggett fail to teach or reasonably suggest a method and system for treating optical signals from a source, the system and method including *the rotatable diffractive optical element (RDOE) having a surface*

carrying a holographic diffraction grating including an array of superimposed facets, each of the facets carrying a diffraction grating(s) which are superimposed, each diffraction grating being angularly offset with respect to each other, the RDOE being positioned to intercept the input optical signal(s) for generating output optical signal(s) and distributing any said output optical signal(s) to any said output optical station(s) (Emphasis added; See Page 11 of Appellant's brief), as generally set forth in Claims 1, 17, and 32. More specifically, the Appellants argue that neither Asakura nor Doggett, either singly or in combination, teach the distribution of any output optical signal(s) to any output station(s) by a RDOE having a surface carrying a holographic diffraction grating including an array of superimposed facets, each facet carrying a diffraction grating angularly offset with respect to the other diffraction gratings. However, it is the belief of the Examiner that the combined teachings of Asakura and Doggett do teach the rotatable diffractive optical element (RDOE) having a surface carrying a holographic diffraction grating including an array of superimposed facets, each of the facets carrying a diffraction grating(s) which are superimposed, each diffraction grating being angularly offset with respect to each other, the RDOE being positioned to intercept the input optical signal(s) for generating output optical signal(s) and distributing any said output optical signal(s) to any said output optical station(s).

In interpreting the claim language recited in Claims 1, 17, and 32, the Examiner notes that each of Claims 1 and 17 recites claim terminology such as 'input optical signal(s)', 'output optical signal(s)', 'diffraction grating(s)', and 'output station(s)'. Since these claim terminology include '(s)', the Examiner has interpreted this to mean 'one or more', e.g. 'one or more input optical signals', 'one or more diffraction gratings', etc. Claim 32, on the other hand, recites

these limitations in the plural, i.e. 'input optical signals', 'output optical signals', 'diffraction gratings', and 'output stations'.

As previously stated in Section 5 of the Office Action dated 8/4/05, Asakura is drawn to a system and method for treating optical signals from a source (See for example Figures 7-8 of Asakura; inherently, a source of light is required to generate the signals having wavelengths of λ_1, λ_2, λ_3 λ_4). The system and method of Asakura further includes a rotatable diffractive optical element (See 92 in Figure 8; col. 4, line 57-col. 5, line 2 of Asakura), and output stations (See 98, 99 in Figure 8 of Asakura), wherein the source carries input optical signals (See 90 in Figure 8 of Asakura), each of said signals being associated with a particular wavelength. *The rotatable diffractive optical element (See 92 in Figure 8; col. 4, line 57-col. 5, line 2 of Asakura) has a surface (i.e. a single facet) carrying a diffraction grating and is positioned to intercept said input optical signals for generating output optical signals and distributing any output optical signal(s) to any output optical station(s) (See col. 1, line 39-54; col. 2, line 49-col. 3, line 18 of Asakura).* The output stations are positioned to receive said output optical signals from the rotatable diffractive optical element (See 98, 99 in Figure 8 of Asakura).

Since each of Claims 1 and 17 recites 'input optical signal(s)', 'output optical signal(s)', and 'output station(s)', the Examiner has interpreted that Claims 1 and 17 may include a single input optical signal, a single output optical signal, and a single output station, since a single input/output signal or a single station has not been excluded. Thus, it is the belief of the Examiner that Asakura specifically discloses a single input signal (See for example any one of λ_1, λ_2, λ_3 λ_4 incident to input fiber 90 in Figure 8 of Asakura) incident to a RDOE including at least a single diffraction grating (See 92 in Figure 8 of Asakura), and distributing any (i.e. *a*

single) output optical signal (See for example λ_2 traversing 98 in Figure 8, or any one of λ_1, λ_3 λ_4 traversing 99 in Figure 8 of Asakura) to any (i.e. *a single*) output optical station (See for example one of 98, 99 in Figure 8 of Asakura).

Claim 32 (as well as Claims 1 and 17 when interpreted in the plural) clearly recites 'input optical signals', 'output optical signals', and 'output stations', all of which are in the plural (i.e. more than one input/output signal and output station). As stated above, Asakura already discloses at least one (and specifically two in particular embodiments) output stations (See 98 and 99 in Figure 8 of Asakura). The Examiner additionally notes that the device disclosed in Figure 8 of Asakura is an optical tap for a wavelength division multiplex signal (See for example Abstract of Asakura) and thus is conventionally utilized in optical communications systems with high transmission throughputs (See for example col. 1, lines 12-col. 2, line 2 of Asakura). The claim limitation '*distributing any output optical signals to any output optical station*' recited in Claim 32 fails to distinguish between whether the output signals are distributed to the output optical stations simultaneously (i.e. multiple output signals arrive at the multiple output stations at the same time) or in a sequential manner (i.e. time sequential signals arrive at any particular output stations one at a time in time sequence order). The Examiner believes that an acceptable interpretation of the above claim limitation is to include the sequential manner of arrival of the output signals to the output stations. Specifically, it is the belief of the Examiner that Asakura specifically discloses multiple single input signals (See for example any one of λ_1, λ_2, λ_3 λ_4 incident to input fiber 90, particular during high throughput transmission, in Figure 8 of Asakura, e.g. a time sequential set of input optical signals with wavelength λ_2) incident in temporal sequence to a RDOE including at least a single diffraction grating (See 92 in Figure 8 of

Asakura), and distributing the multiple single output optical signals (See for example λ_2 traversing 98 in Figure 8, or any one of λ_1, λ_3 λ_4 traversing 99, particularly during high throughput transmission, in Figure 8 of Asakura) to any particular output optical station (See for example one of 98, 99 in Figure 8 of Asakura). Rotation of the RDOE prior to the transmission of the next succeeding pulse allows the next output signal to be sent to a particular output station, depending on the routing requirements for the output signal (e.g. a particular output signal having λ_2 may be sent to 98, the next time sequential output signal having λ_2 may then be sent to 99 after rotation of RDOE 92, and so on). This is very similar to the disclosed invention of the instant application (See for example Figures 3-6 of the instant application, where rotation of the RDOE allows for a set of input signals to be routed to a particular set of output stations, then after a short time a further rotation of the RDOE allows for another set of input signals to be routed to a different set of output stations). Thus, the system of Asakura allows for the distribution of any of the generated multiple single output optical signals to be routed to any of the output optical stations based on the rotation of the RDOE.

Asakura thus discloses the limitations recited in Claims 1, 17, and 32, as set forth above. However, as stated in Section 5 of the Office Action dated 8/4/05, Asakura does not specifically disclose the RDOE being holographic and including an array of superimposed facets, each of the facets carrying a diffraction grating(s) (i.e. one or more diffraction gratings) which are superimposed, each diffraction grating being angularly offset with respect to each other. However, Doggett was cited to evidence conventional holographic disks used to diffract light to a particular point in space (See Abstract; Figures 1-2 of Doggett). In particular, Doggett teaches that the disk may be made interferometrically or holographically, and that holographic

diffracting elements on the disk may include an array of superimposed facets, each of the facets carrying a diffraction grating(s) (i.e. one or more diffraction gratings) which are superimposed, each diffraction grating being angularly offset with respect to each other (See for example Figures 3A, 5-7; col. 3, line 14-col. 4, line 17 of Doggett).

Regarding Appellant's arguments that no suggestion or motivation exists to combine Asakura and Doggett, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, it was noted in Section 5 of the Office Action dated 8/4/05, that it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the RDOE of the system and method of Asakura further be holographic and include an array of superimposed facets, each of the facets carrying a diffraction grating(s) which are superimposed, each diffraction grating being angularly offset with respect to each other, as taught by Doggett, for the purpose of increasing the duty cycle and multiplexing and demultiplexing capability of the system, since a larger number of input signals may be input and multiplexed/demultiplexed by the diffraction gratings, while preventing degradation of the diffracted output signals. Such motivation was provided by Doggett (See for example col. 4, lines 1-10 of Doggett). Further, it is noted that the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the

references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). In the instant case, it is evident to one having ordinary skill in the art that the use of a holographic RDOE having an array of superimposed facets, each of the facets carrying a diffraction grating(s) which are superimposed, each diffraction grating being angularly offset with respect to each other, would allow for increased number of input signals to be processed, thus allowing for more than a single wavelength to be tapped from the system. Further, increased optical signal processing allows for increased processing speed, and hence increased signal throughput.

Regarding Appellant's arguments that neither Asakura nor Doggett teaches a source of input optical signals, the Examiner again refers to Section 5 of the Office Action dated 8/4/05, wherein both Asakura and Doggett either inherently or explicitly disclose a source (again, this is inherent to the system of Asakura since a source of light is required to generate the signals having wavelengths of λ_1, λ_2, λ_3 λ_4 (See Figure 8 of Asakura); Alternatively, input fiber 90 in Figure 8 of Asakura may be considered an input; See also 10 in Figures 1-2 of Doggett). Further, Appellant's specification (See for example Page 4, lines 22-32 of Appellant's specification) merely provides exemplary embodiments of what 'a source of input optical signals' may include (e.g. a laser diode assembly, fiber, optical cable). Since no special definition for 'a source of input optical signals' was provided by Appellant's disclosure, it is believed that both Asakura and Doggett clearly disclose a source, as set forth above.

B) Response to arguments regarding Claim 3 (See Page 16 of Appellant's brief filed 6/20/06)

With regard to the rejection of Claim 3 in Section 6 of the Office Action dated 8/4/05, since Appellant's only argument is that this claim is allowable based on its dependency on Claim 1, the aforementioned rejection of this claim stands since the combined teachings of Asakura and Doggett do teach the limitations recited in Claim 1 as set forth above, and Claims 1, 17, and 32 still remain rejected.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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2/6/07

ARNEL LAVARIAS
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